

1. Circuitry for processing a communication packet, the circuitry comprising:

a look-up engine configured to transfer a first selector to a content-addressable memory and receive a corresponding first result from the content-addressable memory, retrieve a first context structure based on the first result, build a summation block using the first context structure, and transfer the summation block; and

a processor configured to receive and process the summation block to control handling of the communication packet.

2. The circuitry of claim 1 wherein the processor is configured to process header information from the communication packet to generate and transfer the first selector to the look-up engine.

3. The circuitry of claim 1 further comprising the content-addressable memory configured to receive and process the first selector for a first match and transfer the first result corresponding to the first match.

4. The circuitry of claim 1 wherein the first context structure relates to one of: network address translation, billing, packet forwarding, packet security, and packet classification

5. The circuitry of claim 1 wherein the look-up engine is configured to generate and transfer a second selector to the content-addressable memory based on the first selector and receive a corresponding second result from the content-addressable memory, retrieve a second context structure based on the second result, and build the summation block using the second context structure.

6. The circuitry of claim 5 wherein the look-up engine is configured to generate the second selector by modifying a portion of the first selector.

7. The circuitry of claim 5 wherein the processor is configured to indicate a desired modification for the first selector to the look-up engine.

8. The circuitry of claim 5 wherein the look-up engine is configured to generate the second selector by incrementing a portion of the first selector.

9. The circuitry of claim 5 wherein the first context structure and the second context structure respectively relate to a first one and a second one of: network address translation, billing, packet forwarding, packet security, and packet classification.

10. The circuitry of claim 1 wherein the processor, the look-up engine, and the content-addressable memory are configured on a single integrated circuit.

11. A method for operating circuitry to process a communication packet, the method comprising:

transferring a first selector to a content-addressable memory;
receiving a corresponding first result from the content-addressable memory;
5 retrieving a first context structure based on the first result;
building a summation block using the first context structure; and
processing the summation block to control handling of the communication
packet.

10 12. The method of claim 11 further comprising processing header information from the communication packet to generate the first selector.

13. The method of claim 11 further comprising, in the content-addressable memory,
receiving and processing the first selector for a first match and transferring the first
15 result corresponding to the first match.

14. The method of claim 11 wherein the first context structure relates to one of: network
address translation, billing, packet forwarding, packet security, and packet classification

15. The method of claim 11 further comprising:

generating and transferring a second selector to the content-addressable
memory based on the first selector;

receiving a corresponding second result from the content-addressable memory;

retrieving a second context structure based on the second result; and

building the summation block using the second context structure.

16. The method of claim 15 wherein generating the second selector comprises
modifying a portion of the first selector.

17. The method of claim 16 further comprising indicating a desired modification for the
first selector.

18. The method of claim 15 wherein generating the second selector comprises
incrementing a portion of the first selector.

19. The method of claim 15 wherein the first context structure and the second context
structure respectively relate to a first one and a second one of: network address
translation, billing, packet forwarding, packet security, and packet classification.

20. The method of claim 11 wherein the circuitry is configured on a single integrated
circuit.